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ABSTRACT

This issue of the newsletter of the American Association for the Advancement of Science (AAAS) presents articles related to such topics as standardized tests, population education projects, and male dominance in educational success in mathematics and science. Five articles presented relate to higher education and its role in improving instruction on the secondary level, health professions, and the use of personalized instruction. Descriptions of recent publications, meetings and conferences held and opportunities for student internship grants are included. An insight into science and mathematical research and development on an international level is presented in three brief articles. International publications are also presented. A short collection of articles on the metric system is presented. Information is given to facilitate the procuring of a set of tables of metric units for many physical quantities prepared by the National Bureau of Standards. (EB)

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MAR 9 1976

SCIENCE EDUCATION NEWS

American Association for the Advancement of Science

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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February 1976

The Schools

Standardized Tests Under Fire

Standardized tests are "like a lock on the mind, a guard at the factory gate," NEA Executive Director Terry Herndon said in a recent speech. "The only real beneficiaries, aside from the test marketers themselves, are insecure school managers striving for comfort in their relations with school boards, legislators, and governors."

Herndon said the tests follow the technical/industrial model in which teachers are treated like assembly-line foremen and students are treated like cars. "It's time to get the children out of the factory and back into the classroom where they belong." He was referring to any test that compares performance to predetermined norms and is administered in identical form to large numbers of students, such as college board tests, achievement tests given to elementary and secondary school children, graduate record exams, and IQ tests.

Declaring that "standardized testing must go," he offered the following reasons:

- Education is entirely too complex for the most involved standardized test to measure.
- People disagree on the goals of education, yet standardized tests take for granted that everybody places equal value on whatever skill is being tested.
- Testing fosters big brotherism.
- Testing encourages conformity at the expense of creativity.
- Standardized tests fail to do what is claimed for them.—From *NEA Reporter*, February 1976.

Population Education Project

Zero Population Growth, Inc. (ZPG) is conducting a project to introduce or expand population education in the public school systems. It aims to assist state administrators in conducting workshops and integrating population education as a permanent part of their curriculum. Model programs are being carried out in several states. Recently workshops have been held in northern Delaware; Tallahassee, Florida; and Columbus, Ohio. Another is scheduled for Montclair, New Jersey, on 13 March.

Also there will be a population education workshop at the NSTA convention in Philadelphia on 20 March, 3:00 P.M. It will include a brief survey of population trends in the U.S. and the world, films on population and the environment, specific classroom activities, and a free population education kit. For more information write: Elaine Murphy, Director, Population Education Project, Zero Population Growth, Inc., 1346 Connecticut Avenue, N.W., Washington, D.C. 20036.

Males Dominate in Educational Success

Results from NAEP (National Assessment of Educational Progress) assessments in eight learning areas show that males generally do better than females in four major subjects: mathematics, science, social studies, and citizenship.

What is particularly puzzling in these four subjects is that males and females at age 9 show scholastic understandings that are fairly equal. By age 13, however, females have begun a decline in achievement, which continues downward through age 17 and into adulthood.

The following summaries compare male-female achievement at various ages for mathematics and science:

- **Mathematics.** In the 1972-73 NAEP assessment the advantage shown by males, particularly at the older ages, can only be described as overwhelming. At 9 years of age females can do the math basics (addition, subtraction, multiplication, and division) as well as their male counterparts. But when it comes to geometry and measurement, 9-year-old boys already show an advantage. At age 13 females do as well as males on two major math concepts: consumer math, and variables and relationships. But males show a higher achievement level in the area of probability and statistics and increase their advantage in geometry and measurement. By age 17 males outperform the females in all mathematical content areas assessed. The overall difference increases to more than 10 percentage points by the adult level.

Females tend to have more difficulty with word problems than with purely computational problems. Therein lies a paradox: If females can do computation and can read better than males (as shown in various research studies and supported by the NAEP reading assessment), then why can't they work "story" problems better than males?

Another puzzling result from the math assessment is

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the lead males have at the two older ages in answering consumer math problems. Males consistently outperform females on exercises involving buying and household situations . . . but it is usually assumed that in actual households women do most of the buying.

Science. In both the first NAEP science assessment of 1969-70 and the second of 1972-73, the male-female achievement pattern is the same. As males get older there is an increasing tendency for them to perform better than females on the physical science exercises. However, there is little difference between male-female performance on exercises dealing with the biological sciences.

Boys and girls in elementary grades are exposed to both the biological and physical sciences. In high school, science courses, especially physics and chemistry, become electives. For some reason boys choose these courses more often than girls. This differential exposure could explain the male advantage in the science results, particularly from age 17 on.

The question remains: Why do more boys and girls choose to take science courses?

For information on how to obtain reports on the various learning areas assessed by National Assessment, write the NAEP Publications Office, Suite 700, 1860 Lincoln Street, Denver, Colorado 80203. Special reports comparing male-female educational achievements are also available from NAEP headquarters.—From *Spotlight*, NAEP Newsletter, October 1975.

Higher Education

ACS Guidelines Report

The American Chemical Society, through its Council Committee on Chemical Education, is studying practical solutions for improving chemical instruction in the high school. A writing committee met at Reston, Virginia, 26 to 31 December 1975 to establish "Guidelines for the Preparation and Continuing Education of High School Chemistry Teachers: A Systems Analysis." Represented on this committee are college/university chemistry faculties, school of education faculties, high school chemistry teachers, school supervisors, state education departments, AAAS, NSTA, National Association of State Directors of Teacher Education and Certification, the chemical industry, two-year colleges, school boards, and private high schools.

The present draft of the guidelines emphasize the central position of laboratory-centered instruction in chemistry. It calls for support for this position through specific policy decisions and actions from college/university chemistry departments, schools of education, local school officials, state education officials, national scientific and professional organizations, industry, and, of course, teachers.

The 44 behaviorally oriented recommendations cover preservice experiences, continuing education throughout teachers' careers, and relevant administrative coordination and cooperation.

Recommendations for preservice experiences include courses and field experience. Courses in chemistry, other sciences, and instructional techniques should emphasize the practice of recommended skills as distinguished from merely learning about such skills. Field experience should begin early—in the freshman year.

Continuing education throughout teachers' careers should involve deliberate planning with immediate supervisors and college/university specialists. It should emphasize the teachers' professional competence.

Practical suggestions for cooperation between the chemistry department and the school/college of education on the same campus are presented. State officials are urged to sponsor science development centers and to assume leadership in the continuous evaluation of policies which support the chemistry teacher.

Other recommendations reflect concerns for incentive awards which enhance laboratory-centered programs; for the use of para-professional assistants; for Chautauqua-type programs; for support for the purchase of expendable supplies and the maintenance of equipment; for the preparation of a laboratory management handbook; for frequent inter-class, inter-school visits among chemistry teachers; for cooperative workshops involving teachers and college/university personnel; for the exchange of high school and college/university teachers; and for cooperative interactions among chemistry teachers and teachers of other sciences, mathematics, social studies, and English, within the same school systems.

The preliminary draft of the guidelines is scheduled to go through a lengthy review before its expected publication late in 1976. The first public discussions of this draft will be held at the NSTA national meeting in Philadelphia in March 1976.

For further information and to be put on the mailing list for the final document, write to Patricia Lemaire, Department of Educational Activities, American Chemical Society, 1155 16th Street, N.W., Washington, D.C. 20036.—Jay A. Young, Chairman, Writing Committee and Editorial Committee, ACS Guidelines Project.

Fresh Approach to Medical Education

The University of Rochester has received a $2 million grant from the Commonwealth Fund to initiate a "Rochester Plan" of education for the health professions, including medicine. The Rochester Plan provides for closer integration of pre-medical and medical education; preparation for a variety of careers in the health professions besides medicine; and individualized programs, crossing departmental and college lines, that involve greatly expanded faculty advising.

The M.D. degree under the Rochester Plan will still require eight years of study, but instead of two four-year units, one in college and one in medical school, it will have three units, of two, four, and two years. The first two years will be general education, during which students will be counseled about health careers and the ways in which they may be pursued. The next four years will concentrate on the biomedical sciences, but include study in the behavioral and social sciences and the humanities. The last two years will be in clinical medicine. Thus, the major change occurs in the middle

four years, which will integrate work that now is divided between the medical school and the college of arts and science.

Some of the important health careers, in addition to medicine, for which participants in the Rochester Plan will be prepared are biomedical engineering, genetics and genetics counseling, public health, medical computing, biomedical mathematics, medical administration, nursing, medical economics, and specialties in the basic medical sciences and their applications.

PSI at Illinois State University

The Personalized System of Instruction has enabled the Physics Department at Illinois State University to offer advanced physics courses to upper division students even though there are fewer than five students taking each course. The use of PSI has made it possible to continue to offer a physics major in spite of the decline in enrollment in physics at ISU.

The senior-level courses are astrophysics, mechanics, electricity and magnetism, atomic physics, mathematical physics, molecular and solid state physics, computers and physics, and relativity. The instructors work out of their own offices and are considered by the administration of ISU to be engaged in supervision of independent study. They spend an average of one hour per week with each student in each course.

Materials written for these courses are available at cost from Charles Frahm, Department of Physics, Illinois State University, Normal, Illinois 61761.—From *PSI Newsletter*, December 1975.

News from the Center for Personalized Instruction

PSI Workshops in 1976. The Personalized System of Instruction (the Keller Plan) is the subject of a six-day workshop offered by the Center for Personalized Instruction in each of nine locations in the United States and Canada during 1976. The workshop is run as a PSI course about PSI. It not only teaches about PSI, but also guides the participant through the production of his or her own course materials under the supervision of the Center staff. Tuition is $195. Workshops were held in Miami and Denver in January. Others will be offered at the following locations:

St. Louis	8-13 March
Atlanta	19-24 April
New Orleans	24-29 May
Toronto	24-29 May
Washington, D.C.	7-12 June
San Diego	21-26 June
Cable, Wisconsin	2- 7 August

In addition to its regularly scheduled six-day workshops, private workshops for contracting institutions and speakers for faculty gatherings can be arranged.

Study Guides for PSSC Physics. *Study Guides for PSSC Physics* were developed at the MIT Education Research Center by Charles P. Friedman and James S. Strickland, for use with the standard PSSC curriculum. The materials are particularly suitable for individualized instruction in both secondary schools and colleges. The Center for Personalized Instruction has scheduled five workshops throughout the country in 1976 for teachers who will be using these materials for the first time. Samples of the materials are available.

Third National Conference. "Personalized Instruction: Accent on Materials" is the title of the third national conference on PSI to be held 6-8 May 1976 at the Mayflower Hotel, Washington, D.C. One characteristic of personalized instruction, a stress on written materials, has been chosen as a theme for this conference. Two mini-workshops on PSI procedures and a PSI clinic will be offered in addition to presentation of papers.

New Journal. The *Journal of Personalized Instruction* will soon join the *PSI Newsletter* as CPI's second quarterly publication. Two issues will appear in 1976; the first in March. Beginning in March 1977 the *Journal* will be published quarterly. It is intended to be an international, user-oriented, multidisciplinary journal for articles and communications that contribute to the analysis and improvement of personalized instruction. The *Journal* will publish manuscripts of the following types: (1) experimental research reports, (2) case study and descriptive reports, (3) theoretical and methodological papers, (4) review articles, and (5) abstracts and technical notes. Each issue will also contain an annotated listing of all articles dealing with personalized instruction that have recently appeared in other journals. Since the *Journal* is multidisciplinary, technical jargon is inappropriate. Manuscripts submitted for publication will be subjected to multiple peer review; authors will receive the reviewers' comments.

For further details about the PSI workshops, for more information about the study guides for PSSC physics or instructor workshops, for registration information and fees for the third national conference, and for further information and subscription rates for the *Journal of Personalized Instruction* write: Center for Personalized Instruction, Georgetown University, Washington, D.C. 20057.

News from the Center for Bioethics

The Kennedy Institute Quarterly Report, Autumn 1975 issue, reports the following:

The Information Retrieval Project at the Center for Bioethics, Kennedy Institute, Georgetown University, has completed the *Bibliography of Bioethics*, Volume I. It is now available for purchase through its publisher, Gale Research Company (Book Tower, Detroit, Michigan 48226, $24). Volume I, about 230 pages, includes 800 English language materials (print and nonprint) published during 1973 on bioethical topics. Volume II (1974 materials) will be available in the summer of 1976.

Currently the Information Retrieval Project is developing a software package capable of computer-producing future volumes of the *Bibliography*. This software package will provide a valuable tool new to the field of bioethics, an automated information retrieval

system. By 1977 the Kennedy Institute will be able to respond to searches, on demand, of bioethical literature published in the English language from 1973 forward.

From the library of the Center for Bioethics there is a new book selection service for librarians and individual scholars. Subscribers to the service, "New Titles in Bioethics," receive a monthly listing, by subject, of books, government documents, pamphlets, serial titles, and audiovisual aids acquired during the previous four weeks. It provides a regular, up-to-date survey of that part of the literature which is most difficult to control bibliographically—books and other separate publications. The cost is $6 a year, which includes postage and duplicating charges. Checks are payable to the Kennedy Institute. For further information write Doris Goldstein, Center for Bioethics, Kennedy Institute, Georgetown University, Washington, D.C. 20007.

Also under development at the Center for Bioethics is the *Encyclopedia of Bioethics*, a five-year project scheduled for publication in 1977. The two-volume collection will have a total of 305 articles covering all significant viewpoints in the ethics of the life sciences. Previews of two of the articles, which discuss health care in less-developed countries and the state of health and health care in the U.S., are briefly presented in the Winter 1975 issue of the *Kennedy Institute Quarterly Report*. A prospectus is also available. Write the Center for Bioethics at the address given above.

Meetings

American National Metric Council

"Metrication: Myths and Realities" is the theme of the second annual conference and exposition of the ANMC. The conference is scheduled for 5-7 April 1976 at the Washington Hilton Hotel in Washington, D.C. A special metric education session is planned for 6 April. Registration forms are available from ANMC Conference Registration, Suite 700, 1629 K Street, N.W., Washington, D.C. 20006.

Conference on Bioethics

The Northeast Undergraduate Conference on Bioethics will be held on 9-11 April 1976 at the University of Massachusetts at Amherst. The conference will provide a forum for undergraduates to meet and explore the perplexing ethical, legal, and social dilemmas which face modern health care, medicine, and the life sciences. It is open to the public. Inquiries should be sent to the Northeast Undergraduate Conference on Bioethics, % Ira D. Singer, Honors Program, Machmer E-23, University of Massachusetts, Amherst, Massachusetts 01002.

Education Commission of States

The annual meeting of the Education Commission of the States will be held on 26-28 May 1976 at the San Francisco Hyatt-Regency, San Francisco. The Education Commission of the States is a private, nonprofit organization of 45 states, Puerto Rico, and the Virgin Islands. It promotes the advancement of education in the states by working with educators and politicians. For further information write: Education Commission of the States, 1860 Lincoln Street, Denver, Colorado 80203.

International Congress on Mathematical Education

The Third International Congress on Mathematical Education is scheduled to be held in Karlsruhe, West Germany, 16-21 August 1976. Following the examples set by the congresses held in Lyons and Exeter, this congress is designed to offer participants the opportunity of learning about the latest developments in mathematical education at all levels. For further information write to Professor H. Kunle, Mathematisches Institut II, 75 Karlsruhe, Kaiserstrasse 12, Federal Republic of Germany.

28 March-2 April

Association for Educational Communications and Technology (AECT) national convention and exhibit, Convention Center, Anaheim, California. For more information: AECT, 1201 16th Street, N.W., Washington, D.C. 20036.

Opportunity

Student Internship

Internships offering grants up to $600 are available from the Population Institute for undergraduate and graduate students interested in population and environmental issues in their own states. Student interns work directly with their state legislators and agencies researching population-related issues, policies, and legislation. Travel and research expenses are provided in addition to the basic grant.

The internships run from September through May or June; however, summer programs will also be available in selected states. Each intern arranges for academic credit with a faculty advisor at his/her college or university. A final report is submitted to the faculty advisor and to the Population Institute at the end of the school year.

The deadline for applications is 30 April 1976. Announcement of grants will be made in late spring. For additional information write to: Intern Program, The Population Institute, 110 Maryland Avenue, N.E., Washington, D.C. 20002.

Organizations

Essentia Moves

Essentia, formerly funded by the National Science Foundation as Environmental Studies for Urban Youth, has moved again. First in Boulder, Colorado, then to the Evergreen State College in Olympia, Washington, and now in Tiburon, California.

The Essence materials, developed by the project with National Science Foundation funding, have been awarded to Addison-Wesley Publishing Company for commercial distribution. These materials are now available as Essence I and Essence II and are used as stimu-

lators of exploration in instructional programs from kindergarten through college.

With the move from Olympia to Tiburon, Essentia is operating as a private consulting and development group. Bob Samples, Director, is currently working on a host of books and other educational materials. Essentia has also produced the pilot film for a potential 30-week television series in cooperation with the Association for Humanistic Psychology. The pilot film, "Where All Things Belong," sets the pace for the series which features rebirth in contemporary society. Sources in private industry are providing funding for the films.

The application of principles which have emerged during the last five years regarding the human mind provides the basis for much of Essentia's approach. Recognition of the dual functions of the human mind has been available to curriculum developers since the earliest days of federal funding. Essentia acted on this awareness from the outset with the development of the Essence materials.

Samples feels there is a quality of reality to the diverseness of experience he and the others with Essentia are gaining that exceeds the limitations typically inherent in federally funded projects. "In thirteen years' experience with federally funded projects I came to realize that there was more to life than living from proposal to proposal. We tried to get at that same quality of awareness in the Essence materials, extending it to teachers and kids. Now that there is no more proposal writing, I'm busier than ever. That excitement about creativity and reaching for fulfillment is as important to the corporate vice president, the research scientist, and the homemaker as it is to the school kids."

For information about Essentia or reprints of recent related research papers, write Essentia, P.O. Box 129, Tiburon, California 94920.

AAAE

"Interdisciplinary Education" was the theme of the fifth annual conference of the Alliance of Associations for the Advancement of Science, which was recently held in Washington, D.C.

Within the next few months AAAE will release its first annual publication, entitled *Personal Liberty and Public Education*.

For more information write AAAE, 3615 Wisconsin Avenue, N.W., Washington, D.C. 20016.

International

Third World Science and Math

A thorough grasp of science and mathematics is essential if less-advanced countries hope to relate modern technology to their development needs. One of the more successful efforts to improve research on and teaching of science and mathematics is that carried out by the Science and Mathematics Education Center (SMEC), located at the American University of Beirut and funded by the Ford Foundation.

SMEC's major contribution has been the development of new textbooks for elementary and secondary schools in Lebanon, Jordan, Saudi Arabia, and the Sudan. It also has conducted training programs to help teachers learn how to use the revised curricula.

In the Sudan, for example, SMEC is working with staff at Bakht-er-Ruda, the country's foremost center for teacher training and the development of instructional materials. Since 1973 four new textbooks in science and mathematics and accompanying teachers' guides have been written and distributed to elementary and secondary schools by Sudanese trained by SMEC. The new texts emphasize active learning instead of memorization, classroom demonstrations that use locally produced equipment, and subject matter that is related to local conditions. Sudanese now will be trained to evaluate and revise the existing texts, as well as to develop four more books.

SMEC's director is Victor Billeh, Science and Mathematics Education Center, American University of Beirut, Beirut, Lebanon—From *Ford Foundation Letter*, 15 December 1975.

Studies in Higher Education

The European Cultural Foundation's institute for the study of future problems in education policy, inaugurated in January 1975, and based in Brussels, plans to collaborate extensively with American groups, such as the Carnegie Council on Policy Studies for Higher Education, so that research into the difficulties of higher education can be placed in an international scope.

The institute's initial research programs, launched in the summer of 1975, include wide-ranging studies over the following topics:

- Educational leave in Europe (study sponsored by the Carnegie Council): a comparative analysis of the utility of sabbatical leaves in the educational policies of Germany, France, Italy, and Sweden.
- Toward zero-growth in higher education (financed by the Volkswagen Foundation): a statistical study into the reasons why some countries are experiencing rapid growth in the number of students pursuing university education while other countries, especially the United States and certain European nations, are undergoing a serious decline after the post-secondary educational boom of the '60s.
- Educational problems of migrant workers and cultural minorities primarily directed toward the plight of minorities in the European Community: a study of the learning needs of disadvantaged groups and how education improvements can be incorporated into the EC (European Community) regional policy.—From *European Community* (October 1975), 2100 M Street, N.W., Washington, D.C. 20037.

News from RECSAM

The government of Malaysia has taken over full responsibility of RECSAM (Regional Center for Education in Science and Mathematics) in Penang, Malaysia. On 13 June 1975 Malaysia signed a second memorandum of agreement with SEAMEO (Southeast Asian Ministers of Education Organization) for taking

over the entire responsibility of operational cost of RECSAM over the next five years beginning in July 1975. The Secretary-General of the Ministry of Education, Abdul Kadir bin Talib, signed on behalf of the government of Malaysia, and Vitaliano Bernardino, the Director of SEAMES (Southeast Asian Ministers of Education Secretariat), for SEAMEO.

Malaysia has allocated about M$4.6 million (Malaysian dollars) for the full operational costs of the Center for the next five years. In addition the Malaysian government has allocated a further M$3,150,000 for the construction of more facilities and awarding of scholarships and fellowships. Of this amount M$1.65 million will be used for the construction of an information-library block and a conference hall. The rest will be given to the SEAMEO Educational Development Fund to support scholarships/fellowships and other training costs for scholars from member countries attending courses at the Center.

In the last five years RECSAM has provided training for more than 900 key educators and personnel in various areas of curriculum development in science and mathematics. The main emphasis in RECSAM's second five-year plan of operation will be on rural education. The development of teaching modules, teachers' guides, and the study of science and mathematics concepts for the particular needs of rural children are included in the activities drawn up for the next five years.—From *RECSAM Newsletter*, No. 21, April-June 1975.

Publications

ICSU Seminar Report

The Committee on the Teaching of Science of the International Council of Scientific Unions (ICSU) has recently published the report of a seminar held in Paris in May 1974 on the subject of "Integration, Coordination, or Separation of Sciences at University Level." This report, which contains a summary of the papers presented at the seminar is available from the British Council, 10 Spring Gardens, London SW1A 2BN, England, free of charge.

From UNESCO

The report of a symposium on "Interactions between Linguistics and Mathematical Education," which was held in Nairobi, Kenya, in September 1974, sponsored by UNESCO, CEDO, and ICMI; and the report of a seminar on "New Trends in the Utilization of Educational Technology for Science Education," held at UNESCO in 1972, jointly sponsored by the ICSU Committee on the Teaching of Science and UNESCO, are available from UNESCO, 7 Place de Fontenoy, 75700 Paris France.

Worldwatching

"Women in Politics: A Global Review," by Kathleen Newland, is the third in a series of papers published by Worldwatch Institute in an effort to identify future social trends and problems. The first two papers examined the scarcity of firewood in developing countries and the global politics of food distribution. Future papers will discuss the potential for energy conservation in the United States, current trends in population and family planning, the multifaceted nature of the population problem, and nuclear proliferation.

Worldwatch Paper 3 is part of a broader project looking at the changing role of women worldwide and its impact on politics, economic development, and social structures.

Worldwatch publications are available on a subscription basis for $25 a year. Single copies can be purchased for $2.00. Bulk rates for two or more copies are available. Write Worldwatch Institute, 1776 Massachusetts Avenue, N.W., Washington, D.C. 20036.

Population Education Materials

Population Education: Sources and Resources is a recent reference booklet/bibliography on available information and materials on population—study guides, reference guides, curriculum units, texts, charts, games, films, newsletters; also names and addresses of organizations and agencies which are sources of materials. Single copies of the booklet are free; multiple copies are $1.00 each from the Population Reference Bureau, Inc., 1754 N Street, N.W., Washington, D.C. 20036.

Also, the January 1976 issue of *Interchange*, the Population Reference Bureau's newsletter, discusses the subtleties of the concept of zero-population growth, sketches a classroom activity for learning how to interpret age-sex pyramids, and lists further sources and resources in population education. For more information write to Population Reference Bureau.

Unified Science

Abstracts of Unified Science Programs contains abstracts describing over 150 unified science programs at various grade levels in several countries, and includes the name and address of a contact person for each program. It is available for $2.50 from the Federation for Unified Science Education, Box 3138, Columbus, Ohio 43210.

New Journals

Problem Solving

The first issue of a new semi-annual journal called *Real Problem Solving in Education* will be published this spring by the Unified Science and Mathematics for Elementary Schools (USMES) project. The purpose of the journal is to aid teachers and schools in including real problem solving as an important part of the curriculum. It will provide new resource material and continuing evidence of the efficacy of the problem-solving approach to education. Articles included in the first issue will cover a historical overview on problem solving in the curriculum, documentation of work done by students in solving real problems that are not part of USMES, description of strategies utilized by teachers in promoting the problem-solving process in their classrooms, suggestions to teachers about specific areas such as student assessment, and information on specific investigations or

skills that may be needed during work on real problems. For further information write the editor, Betty Beck, USMES, Education Development Center, 55 Chapel Street, Newton, Massachusetts 02160.

International Commentary

Important for the Future is a new monthly publication of comment and opinion from UNITAR (United Nations Institute for Training and Research). It aims to discuss a wide range of ideas on international issues relevant for the future, whether or not those ideas are orthodox or conform to currently conventional wisdom. The first issue, September 1975, includes brief discussions of the significance of CO_2 in the atmosphere, the new technology of recombinant DNA, development of petroleum deserts, geopressure zones, petroleum definitions, electric cars, and pocket calculators vs. computers.

For more information write: UNITAR, 801 United Nations Plaza, New York, N.Y. 10017.

Population and Development

Population and Development Review is a new quarterly journal which will address the following questions: What are current patterns of demographic trends and how are they related to development? What are the consequences of these trends on human welfare, and in particular how are their benefits and costs distributed? How can public policies mitigate the social costs of population change and increase its benefits?

The issues raised by the interaction of population and development processes affect the entire society; their discussion should claim the widest public interest. The *Review* will aim to discuss these issues without undue simplification but, equally, without scholarly paraphernalia that would make the discussion accessible only to the specialist. For more information write to the publisher, the Population Council, 245 Park Avenue, New York, N.Y. 10017.

Other Items of Interest

Energy Information

The Energy Information Service (229 Seventh Avenue, New York, N.Y. 10011) sponsors an Energy Speakers Bureau for use by citizen groups and other organizations. The speakers include "experts in the areas of coal, oil, hydro energy, natural gas, solar, geothermal, nuclear power, and conservation."

Science on Television

The NOVA series of science programs for 1976 has already begun. Telecasts on public television are scheduled in many cities for the dates given below. Often programs are also repeated later in the week. Please consult your local television listings for exact times.

March	7:	The Renewable Tree (tree farming)
	14:	The Williamsburg File (an archeologist's tour)
	21:	The Overworked Miracle (overused antibiotics)
	28:	What Time Is Your Body?
April	4:	The Woman Rebel (about Margaret Sanger)
	11:	Benjamin (a baby's first year of living)
	18:	The Underground Movement (life in the soil)
	25:	Secrets of Sleep
May	2:	Netsilik (the Eskimoes of Pelly Bay)
	9:	To be announced.
	16:	How Much Do You Smell?
	23:	Peenemunde (German rocket development)
	30:	The Lost World of the Maya
June	6:	NOVA Magazine (three 20-minute films)
	13:	The Transplant Experience (Shumway's heart transplants)
	20:	To be announced.
	27:	The First Signs of Washoe (chimp learning sign language)

For more information write: Michael Ambrosino or Betsy Anderson, NOVA, WGBH Educational Foundation, 125 Western Avenue, Boston, Massachusetts 02134, or telephone (617) 492-2777.

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WILLIAM D. CAREY, *Executive Officer*
ARTHUR H. LIVERMORE,
Head, Office of Science Education
JOSEPH M. DASBACH, *Program Associate*
ORIN MCCARLEY, *Managing Editor*

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Metric System

The Metric Conversion Act of 1975 became Public Law 94-168 with President Ford's signature on 23 December 1975. The new law states that it is the policy of the United States "to coordinate and plan the increasing use of the metric system in the United States and to establish a United States Metric Board to coordinate the voluntary conversion to the metric system."

The composition and method of selection of the members of the board is a recognition of the importance of metric conversion and its diffuse impacts upon American society. The chairperson and 16 members of the board are to be appointed by the President with the advice and consent of the Senate. Twelve members are to be chosen from lists of individuals submitted by organizations and groups with the following interests: engineering, science and technology, manufacturing (including retailing and commerce), labor, state and local governments, small business, building construction, standards making, and education. Four members are to be selected at large to represent consumers and other concerned groups.

The functions of the board encompass, among other things, public education, specifically, to "assist the public, through information and education programs, to become familiar with the meaning and applicability of metric terms and measures in daily life. Such programs shall include (A) public information programs conducted by the board, through the use of newspapers, magazines, radio, television, and other media, and through talks before appropriate citizens groups, and trade and public organizations; (B) counseling and consultation by the Secretary of Health, Education, and Welfare; the Secretary of Labor; the Administrator of the Small Business Administration; and the Director of the National Science Foundation, with educational associations, state and local educational agencies, labor education committees, apprentice training committees, and other interested groups, in order to assure (i) that the metric system of measurement is included in the curriculum of the Nation's educational institutions, and (ii) that teachers and other appropriate personnel are properly trained to teach the metric system of measurement; . . . ."

Metric Guidelines

Would you like a set of tables of metric units for many physical quantities, all compiled on a single page? Such a compilation (quantities, names of units, symbols) has been prepared for educators by the National Bureau of Standards, entitled "Metric System of Weights and Measures: Guidelines for Use."

The single sheet lists the following tables: 7 SI basic units (length, mass, time, electric current, temperature, amount of substance, and luminous intensity) plus two supplementary units (plane angle, solid angle); 17 SI derived units with special names (frequency, force, capacitance, magnetic flux, illuminance, etc.); 11 examples of SI derived units without special names (acceleration, magnetic field strength, specific volume, etc.); and 16 examples of SI derived units expressed in terms of special names (surface tension, heat capacity, electric field strength, permeability, etc.).

Also included are a table of SI prefixes (from exa to atto) and a table of 8 units which are not part of SI, but are used so widely that it is impractical to abandon them (minute, degree, liter, etc.). A dozen units are put into limbo—their usage is well established, but using them officially will be acceptable for a limited time subject to future review, e.g., knot, angstrom, hectare, bar, roentgen. And, finally, 6 units are no longer considered acceptable.

For a free copy of these tabular guidelines write to: Dexter Magers, Room 3010 ROB, U.S. Office of Education, 400 Maryland Avenue, S.W., Washington, D.C. 20202.

Speakers Network for Metric Information

The National Bureau of Standards has established a nationwide speakers bureau to provide information on the growing use of the metric system of weights and measures. More than 125 persons in 47 states have agreed to act as resources for metric information in their areas. Eventually every geographic region in the country will be covered. Groups and organizations desiring metric speakers should contact the National Speakers Bureau, Metric Information Office, Room A166, Technology Building, National Bureau of Standards, Washington, D.C. 20234.

American Association for the Advancement of Science
1515 Massachusetts Avenue, N.W.
Washington, D.C. 20005

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